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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/086,397	03/01/2002	Gary K. Starkweather	167407.1	1318

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EXAMINER	
KUMAR, SRILAKSHMI K	

ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 11/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/086,397	STARKWEATHER ET AL.	
	Examiner	Art Unit	
	Srilakshmi K. Kumar	2675	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,11-21 and 28-47* is/are pending in the application.

4a) Of the above claim(s) *29-47* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,11-21 and 28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

The following office action is in response to the amendment filed March 19, 2004 and the election/restriction response on September 2, 2004. Claims pending are 1-5, 11-21, 28-47 of which Claims 1-5, 11-21 and 28 have been elected and Claims 29-47 are non-elected. Claims 6-10 and 22-27 have been cancelled.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 11-18 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoyama et al (EP 0 831 352 A1) (hereinafter known as Yokoyama).

As to independent claim 16, Yokoyama discloses a microelectrical mechanical optical display engine (col. 28, lines47-50))comprising, a microlens array having an array of plural lenslets for receiving and directing illumination light (col. 28, lines 55-col. 29, lines 14, col. 26, lines 36-43); an aperture plate through which plural pixel apertures extend (col. 29, lines 4-9), the plural pixel apertures being aligned with and to receive illumination light from the plural lenslets of the microlens array (col. 29, lines 15-30); and a microelectrical mechanical reflector array positioned opposite the aperture plate from the microlens array (Fig. 20, item 151), the microelectrical mechanical reflector array including plural microelectrical mechanical actuators that support reflectors in alignment with the plural pixel apertures to receive and reflect the illumination light (Fig. 20, item 151, shown reflecting), the plural microelectrical mechanical

actuators being constructed and arranged to orient the reflectors selectively to direct the illumination light back through the pixel apertures or against the aperture plate (Fig. 20, see light reflected).

As to dependent claim 1, limitations of claim 16, and further comprising, Yokoyama discloses an illumination source constructed and arranged to provide illumination light and a collimating lens constructed and arranged to receive and collimate the illumination light (col. 24, lines 5-15).

As to dependent claim 2, limitations of claim 1, and further comprising, Yokoyama discloses a selective reflector positioned to receive the illumination light from the collimating lens and to direct the illumination light to the microlens array (col. 24, lines 5-15).

As to dependent claim 3, limitations of claim 2, and further comprising, Yokoyama discloses wherein the selective reflector is constructed and arranged to transmit the illumination light from the pixel apertures toward the display screen (Fig. 22, is the display unit where the reflector transmits illuminated light toward the display screen).

As to dependent claim 4, limitations of claim 3, and further comprising, Yokoyama discloses wherein the selective reflector includes a beamsplitter (col. 22, lines 6-45).

As to dependent claim 11, limitations of claim 1, and further comprising, Yokoyama discloses wherein the illumination source includes only one light source (Fig. 20 item 18).

As to dependent claim 28, limitations of claim 16, and further comprising, Yokoyama discloses a display screen that receives the illumination light reflected from the microelectrical mechanical reflector array (Fig. 22, is the display unit where the reflector transmits illuminated light toward the display screen).

As to dependent claim 12, limitations of claim 28, and further comprising, Yokoyama discloses wherein the display screen is a transmissive display screen (abstract).

As to dependent claim 13, limitations of claim 1, and further comprising, Yokoyama discloses wherein the illumination source is monochromatic (col. 10, lines 20).

As to dependent claim 14, limitations of claim 1, and further comprising, Yokoyama discloses wherein the illumination source is polychromatic (col. 6, lines 33-35).

As to dependent claim 15, limitations of claim 14, and further comprising, Yokoyama discloses wherein the illumination source is constructed and arranged to provide different chromatic segments of the illumination light over different successive time periods (col. 6, lines 33-40).

As to dependent claim 17, limitations of claim 16, and further comprising, Yokoyama discloses wherein the microelectrical actuators are electrostatic microelectrical mechanical actuators (col. 10, lines 13-57).

As to dependent claim 18, limitations of claim 17, and further comprising, Yokoyama discloses wherein the microelectrical mechanical actuators have first and second orientation states, only one of which requires electrostatic activation (col. 10, lines 13-57).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 5 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama as applied to claim 16 above, and further in view of Roberson et al (US 6,137,623).

As to dependent claim 5, limitations of claim 16, and further comprising, Yokoyama discloses wherein the microelectrical mechanical reflector array is formed on a planar substrate (fit. 20, item 102). Yokoyama does not disclose where the plural microelectrical mechanical actuators support the reflectors on actuator arms that in one state are co-planar with the substrate and the reflectors. Roberson et al disclose in Fig. 3 and 4, col. 2, lines 50-62, col. 3, lines 56-col. 4, lines 16, where the plural microelectrical mechanical actuators support the reflectors on actuator arms that in one state are co-planar with the substrate and the reflectors. It would have been obvious to one of ordinary skill in the art to incorporate the feature of Roberson et al into that of Yokoyama as Roberson et al disclose in col. 3, lines 30-34, wherein this type of actuators would reduce the cost of the device.

As to dependent claim 19, limitations of claim 17, and further comprising, Yokoyama does not disclose wherein the plural mechanical actuators support the reflectors on actuator arms that are formed as bimorphs having a characteristic residual stress. Roberson et al disclose in Fig. 3 and 4, col. 2, lines 50-62, col. 3, lines 56-col. 4, lines 16 wherein the plural mechanical actuators support the reflectors on actuator arms that are formed as bimorphs having a characteristic residual stress. It would have been obvious to one of ordinary skill in the art to incorporate the feature of Roberson et al into that of Yokoyama as Roberson et al disclose in col. 3, lines 30-34, wherein this type of actuators would reduce the cost of the device.

As to dependent claim 20, limitations of claim 19, and further comprising, Yokoyama does not disclose wherein the microelectrical mechanical actuators include an electrostatic

activation electrode that applies a force against the characteristic residual stress of the actuator arms. Roberson et al disclose in Fig. 3 and 4, col. 2, lines 50-62, col. 3, lines 56-col. 4, lines 16 wherein the microelectrical mechanical actuators include an electrostatic activation electrode that applies a force against the characteristic residual stress of the actuator arms. It would have been obvious to one of ordinary skill in the art to incorporate the feature of Roberson et al into that of Yokoyama as Roberson et al disclose in col. 3, lines 30-34, wherein this type of actuators would reduce the cost of the device.

As to dependent claim 21, limitations of claim 20, and further comprising, Yokoyama does not disclose wherein the microelectrical mechanical actuators are constructed and arranged to orient the reflectors selectively according to drive signals provided by a display driver, the engine further comprising an orientation storage system separate from the electrostatic activation electrode to selectively hold the microelectrical mechanical actuators in at least one orientation. Roberson et al disclose in col. 2, lines 50-62, col. 3, lines 56-col. 4, lines 16 wherein the microelectrical mechanical actuators are constructed and arranged to orient the reflectors selectively according to drive signals provided by a display driver, the engine further comprising an orientation storage system separate from the electrostatic activation electrode to selectively hold the microelectrical mechanical actuators in at least one orientation. It would have been obvious to one of ordinary skill in the art to incorporate the feature of Roberson et al into that of Yokoyama as Roberson et al disclose in col. 3, lines 30-34, wherein this type of actuators would reduce the cost of the device.

Response to Arguments

5. Applicant's arguments, see pages 12-16, filed March 19, 2004, with respect to the rejection(s) of claim(s) 1-27 under 35 USC 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Yokoyama et al (EP 0 831 352 A1) and Roberson et al (US 6,137,623).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Srilakshmi K. Kumar whose telephone number is 571 272 7769. The examiner can normally be reached on 10:00 am to 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on 571 272 3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Srilakshmi K. Kumar
Examiner
Art Unit 2675

SKK March 3,2006

SUMATI LEFKOWITZ
SUPERVISORY PATENT EXAMINER